CLAIMS

1. A device for the extracorporeal treatment of blood comprising:

- at least one exchanger comprising a semi-permeable membrane dividing said exchanger into a first chamber and a second chamber, at least one first inlet for blood to be treated being in fluid communication with the first chamber of the exchanger, a first fluid outlet being in fluid communication with the first chamber of the exchanger and a second fluid outlet being in fluid communication with the second chamber of the exchanger,
- an input line for blood to be treated connected to the first inlet of the exchanger,
- a blood output line connected to the first outlet of the exchanger,
- at least one treatment unit comprising a semi-permeable membrane dividing the treatment unit into a first chamber and a second chamber, the treatment unit having at least one first fluid inlet in fluid communication with the second chamber of the treatment unit and at least one first fluid outlet in fluid communication with the first chamber of the treatment unit,
- the second outlet of the exchanger being in fluid communication with the first inlet of the treatment unit,
- the first outlet of the treatment unit being in fluid communication with the input line,

wherein:

- the treatment unit includes a second fluid outlet in fluid communication with the second chamber of the treatment unit;

- the second outlet of the treatment unit is in fluid communication with a first waste liquid discharge line.

2. A device according to claim 1 wherein a first duct is connected between the second outlet of the exchanger and the first inlet of the treatment unit.

3. A device according to claim 1 wherein a second duct is connected between the first outlet of the treatment unit and the first inlet of the exchanger.

4. A device according to claim 1 comprising a first waste liquid discharge line connecting the second outlet of the treatment unit to a first waste liquid container.

5. A device according to claim 1, wherein the molecular permeability of the membrane of the exchanger is greater than the molecular permeability of the membrane of the treatment unit, at least above a certain molecular weight.

6. A device according to claim 5, wherein the membrane of the exchanger is a high-flow membrane and the membrane of the treatment unit is a low-flow membrane.

7. A device according to claim 5 wherein the ratio of the cut-off value of the first membrane to the cut off value of the second membrane is less than or equal to 3.

8. A device according to claim 5 wherein the difference in the cut-off value between the first membrane and the second membrane lies between 20 000 dalton and 30 000 dalton.

9. A device according to claim 5 wherein the cut-off value of the first membrane is less than or equal to 40 000 dalton.

10. A device according to claim 5 wherein the cut-off value of the second membrane is less than or equal to 10 000 dalton.

11. A device according to claim 1, wherein a post-dilution line is connected, at one end, to the output line and is connected, at its other end, to a first source of sterile liquid.

12. A device according to claim 1 or 11, wherein a pre-dilution line is connected, at one end, to the input line and connected, at its other end, to a second source of sterile liquid.

13. A device according to claim 12 wherein the pre-dilution line is connected directly to said second duct.

14. A device according to claim 12 wherein the pre-dilution line is connected directly to the input line.

15. A device according to claim 11 or 12 wherein at least one source of sterile liquid is a bag of sterile liquid.

16. A device according to claim 1, wherein the exchanger is a plasma filter.

17. A device according to the preceding claim wherein the plasma filter has a cut-off value between one million and five million dalton.

18. A device according to claim 16 or 17 wherein the treatment unit has a cut-off value less than or equal to 250 000 dalton.

19. A device according to claim 18 wherein the treatment unit comprises a semi-permeable membrane having a cut off value such that all albumin molecules pass through said membrane.

20. A device according to claim 2 comprising a reactor active on the first duct.

21. A device according to claim 2 comprising an adsorption device active on the first duct.

22. A device according to claim 2 comprising a radiation device active on the first duct.

23. A device according to claim 1 comprising first means for regulating liquid flow rate placed on the input line connected to the first inlet of the exchanger.

24. A device according to claim 1 comprising a first duct connecting the second outlet of the exchanger an the first inlet of the treatment unit and comprising first means for regulating liquid flow rate placed on the input line exactly between the first inlet of the exchanger and a connection point connecting the input line to the second duct.

25. A device according to claim 1 comprising a first duct connecting the second outlet 5 of the exchanger an the first inlet of the treatment unit; a second duct connecting the

first outlet of the treatment unit and the first inlet of the exchanger; first means for regulating liquid flow rate placed on the input line upstream of the connection point connecting the input line to the second duct; and second means for regulating liquid flow rate placed on the second duct.

26. A device according to claim 1 comprising a first duct connecting the second outlet of the exchanger an the first inlet of the treatment unit; third means for regulating liquid flow rate placed on the first duct connecting the second outlet of the exchanger to the first inlet of the treatment unit.

27. A device according to claim 1 comprising a post-dilution line connected, at one end, to the output line, and, at its other end, to a first source of sterile liquid; and comprising fourth means for regulating liquid flow rate placed on the post-dilution line.

28. A device according to claim 1 comprising fifth means for regulating liquid flow rate placed on the waste liquid discharge line and connecting the second outlet of the treatment unit to a drain.

29. A device according to claim 12 comprising sixth means for regulating liquid flow rate placed on the pre-dilution line.

30. A device according claim 1 comprising a bag containing a first source of sterile liquid for post-dilution, and wherein the first waste liquid container connected to the

discharge line from the treatment unit is a bag for receiving waste liquid.

31. A device according to claim 30 comprising a balance to weigh the bag of sterile liquid and the bag of waste liquid.

32. A device according to claim 31 wherein said balance comprises a first independent balance to weigh the bag of sterile liquid and a second independent balance to weigh the bag of waste liquid.

33. A device according to claim 30 comprising:
a post-dilution line connected, at one end, to the output line, and, at its other end, to a first source of sterile liquid;
fourth means for regulating liquid flow rate placed on the post-dilution line;
a balance to weigh the bag of sterile liquid and the bag of waste liquid;
fifth means for regulating liquid flow rate placed on the waste liquid discharge line connecting the second outlet of the treatment unit to a drain; and a calculation and control unit to receive weight signals emitted by the balance and to control one or both the fourth and the fifth means.

34. A device according to claim 33 wherein said balance comprises a first independent balance to weigh the bag of sterile liquid and a second independent balance to weigh the bag of waste liquid ,said calculation and control unit receiving first and second weight signals emitted by the first and second balances and independently controlling the fourth means and the fifth means as function of said first and second weight signals.

35. A method for the extracorporeal treatment of blood to be implemented on a device for the extracorporeal treatment of blood comprising:

- an exchanger comprising a semi-permeable membrane dividing said exchanger into a first chamber and a second chamber, at least one first inlet for blood to be treated in fluid communication with the first chamber of the exchanger, a first fluid outlet in fluid communication with the first chamber of the exchanger and a second fluid outlet in fluid communication with the second chamber of the exchanger,
- an blood input line for blood to be treated connected to the first inlet of the exchanger,
- a blood output line connected to the first outlet of the exchanger,
- a treatment unit comprising a semi-permeable membrane dividing said treatment unit into a first chamber to which at least one first fluid outlet is connected, and comprising a second chamber to which at least one first fluid inlet and a second outlet are connected,

the method comprising the following steps:

- sending blood through the input line connected to the exchanger,
- filtering blood first in the exchanger, producing a first filtrate,
- filtering the first filtrate at least a second time in the treatment unit, producing a second filtrate,
- sending the second filtrate through the input line to effect a pre-dilution of the blood to be treated,
- sending the blood out from the exchanger to the output line,
- sending the non-filtered liquid to the drain line.

36. Method according to preceding claim wherein the second filtration step filters through the membrane of the treatment unit molecules of molecular weight less than the molecular weight of the molecules filtered by the membrane 16 of the exchanger during the first filtration step.